

5 sending the further information for the partial copy to the server in response to the  
 6 determination.

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 1 56. (amended) The method set forth in any one of claims [27 or 28] 54 or 55 wherein:  
 2 the step of determining a dataset is performed by determining a likelihood that a  
 3 query will be made to the dataset.

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 1 62. (amended) A memory device characterized in that:  
 2 the memory device contains code which, when executed by a processor, performs a [A]  
 3 method employed in a server in a network, the server receiving requests from users of the  
 4 network for information belonging to an information source to which the server has  
 5 access, the server having a partial copy of the information belonging to the information  
 6 source, and  
 7 the method serving to update the partial copy and comprising the steps of:  
 8 dynamically acquiring request information other than the fact that the requested  
 9 information is not in the copy;  
 10 determining from the acquired request information that a future request for  
 11 particular information is probable; and  
 12 obtaining the particular information from the information source.

**Please add new claims 76-105:**

1 --76. A memory device characterized in that:  
 2 the memory device contains code which, when executed by a processor, performs  
 3 a method employed in an information source in a network to update a partial copy

4 of the information in the information source, the partial copy being contained in a  
5 server accessible to the information source,  
6 the method comprising the steps of:  
7 detecting a change in information in the information source that is also in a partial  
8 copy; and  
9 sending an update message indicating the change to the server, the update  
10 message being sent without intervention by the server.

1 77. The memory device set forth in claim 76, further characterized in that:

2 the information source is a database system of the type wherein trigger code may  
3 be associated with the information, the trigger code being executed when the information  
4 is updated and  
5 the step of sending an update message is performed by the trigger code.

1 78. The memory device set forth in either of claims 76 or 77 further characterized in that  
2 the method further comprises the step of:  
3 sending further information for the partial copy to the server in response to a  
4 request from the server.

1 79. The memory device set forth in either of claims 76 or 77 further characterized in  
2 that the method further comprises the steps of:  
3 making a determination at the information source that a future request for further  
4 information is probable; and

5 sending the further information for the partial copy to the server in response to the  
6 determination.

1 **80.** The memory device set forth in claim 79 further characterized in that:

2 in the method, the step of making a determination is performed using a log of  
3 requests in the information source.

1 **81.** The memory device set forth in claim 79 further characterized in that:

2 in the method, the step of making a determination is performed using information  
3 about an event that will result in requests.

1 **82.** The memory device set forth in claim 79 further characterized in that:

2 in the method, the step of making a determination is performed using information  
3 about a time of occurrence of the event to make the determination.

1 **83.** The memory device set forth in either of claims 76 or 77 further characterized in that:

2 the method further comprises the step of  
3 receiving in the information source a determination that is made elsewhere that a  
4 future request for the information is probable.

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2 **84.** A memory device characterized in that:

the memory device contains code which, when executed by a processor, performs a  
3 method of querying datasets in a server that provides a standard interface for querying remote  
4 data sets to a program executing on the server,

the method comprising the steps of

receiving a query for a remote dataset in a form required by the standard interface;

determining whether a copy of a dataset to be queried is present in a queryable cache

local to the server; and

if the copy is present in the queryable cache, querying the copy and otherwise querying

the remote dataset,

whereby the queryable cache is transparent to the program.

**85.** The memory device set forth in claim 84 further characterized in that:

in the method, the form required by the standard interface uses global identifiers

for the remote data sets and

the copies in the queryable cache have local identifiers; and

the method further includes the steps of :

providing the global identifier for a dataset being queried to a query analyzer in

the server; and

if there is a copy of the data set indicated by the global identifier, receiving the

local identifier from the query analyzer,

the local identifier being used in the step of querying the local copy.

**86.** The memory device set forth in claim 84 wherein the method further comprises the

steps of:

determining a dataset for which a copy is needed in the cache;

obtaining the copy; and

adding the copy to the cache.

87. The memory device set forth in claim 86 wherein the method further comprises the steps of:

determining a dataset for which a copy is no longer needed in the cache; and  
removing the copy from the cache.

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88. The memory device set forth in any one of claims 86 or 87 wherein:

the step of determining a dataset is performed by determining a likelihood that a query will be made to the dataset.

89. The memory device set forth in claim 88 wherein:

in the step of determining a dataset, a query log that lists past queries is used to determine the likelihood that a query will be made.

90. The memory device set forth in claim 88 wherein:

in the step of determining a dataset, information about an event that will result in queries to a dataset is used to determine the likelihood that a query will be made.

91. The memory device set forth in claim 90 wherein:

in the step of determining a dataset, information about a time of occurrence of the event is used to determine the likelihood that a query will be made.

92. The memory device set forth in claim 84 wherein

2 when a change occurs in a remote dataset of the remote datasets, an indication  
3 including the change is sent to the server without intervention by the server and  
4 the method further comprises the steps of:

5 receiving the indication and modifying any copy of the changed dataset as  
6 required by the indication.

1 **93.** The memory device set forth in claim 85 wherein the method further comprises the  
2 step of:

3 receiving an indication from the query analyzer whether the copy is present in the  
4 queryable cache.

1 **94.** The memory device set forth in claim 62 wherein:

2 the request information employed in the method is information usage information  
3 maintained in the server.

1 **95.** The memory device set forth in claim 94 wherein:

2 the request information is information received from a source external to the  
3 server.

1 **96.** A memory device characterized in that:

2 the memory device contains code which, when executed by a processor, performs  
3 a method practiced in a middle-tier Web server of the type that has a web page layer for  
4 providing Web pages in response to URLs, a Web application layer for providing data  
5 for the Web pages, and a data access layer that responds to a request from the Web

6 application layer by querying a remote dataset of a plurality thereof and returning a  
7 response to the query to the Web application layer,

8 the method comprising the steps performed in the data access layer of:

9 determining from the request whether a copy of the dataset to be queried is  
10 present in a queryable cache local to the Web server; and

11 if the copy is present, querying the copy and otherwise querying the remote data  
12 set.

1 **97.** The memory device set forth in claim 96 wherein:

2 the request is in a form usable for querying the remote dataset.

1 **98.** The memory device set forth in claim 96 wherein

2 the remote datasets are identified by global identifiers;

3 the copies are identified by local identifiers;

4 the request employs a global identifier for identifying the remote dataset; and

5 the method further comprises the steps performed in the data access layer of:

6 using the global identifier to determine whether a copy of the remote dataset is in  
7 the cache; and

8 if the copy is present, receiving a local identifier for the copy from the cache; and

9 using the local identifier to query the copy.

1 **99.** The memory device set forth in claim 98 wherein:

2 the remote data set is identified by a global context containing one or more of the  
3 global identifiers; and

4 the copy is identified by a local query context containing one or more of the local  
5 identifiers;

6 in the step of using the global identifier, the global context is used; and

7 in the step of using the local identifier, the local context for the copy is returned  
8 and is used to query the copy.

1 **100.** A memory device characterized in that:

2 the memory device contains code which, when executed by a processor, performs a  
3 method employed in a server that is used in a network to provide a first object in response  
4 to a network handle defined by the network, the first object incorporating information  
5 from a remotely-stored particular second object of a plurality of second objects, and  
6 the method comprising the steps of:

7 using a specifier that is not a network handle to determine whether a copy of the  
8 particular second object is in a cache that is local to the server and contains copies of one  
9 or more of the second objects;

10 if the copy is in the cache, obtaining the information from the copy and otherwise  
11 obtaining the information from the remotely-stored particular second object;

12 incorporating the obtained information into the first object; and  
13 providing the first object.

1 **101.** The memory device set forth in claim 100 wherein:



2 the method steps of incorporating the obtained information into the first object  
3 and providing the first object are performed in an object-providing component of the  
4 server; and

5 the method further comprises the step of:

6 receiving the specifier from the object-providing component.

1 **102.** The memory device set forth in claim 101 wherein:

2 the specifier further specifies the information in the remotely-stored particular  
3 second object; and

4 in the method step of obtaining the information, the specifier is used to obtain the  
5 information from the remotely-stored particular second object,  
6 whereby the cache is transparent to the object-providing component.

1 **103.** The memory device set forth in any one of claims 100 through 102 wherein:

2 the second objects are database objects; and

3 the specifiers are queries that access the database objects.

1 **104.** The memory device set forth in claim 103 wherein:

2 the server is a Web server, the network handle is a URL, and the first object is a  
3 Web page.

**105.** The memory device set forth in claim 103 wherein:

the database objects are relational database objects.--